

ABSTRACT OF THE DISCLOSURE

The present invention is generally directed to a multi-stage epi process for forming semiconductor devices, and the resulting device. In one illustrative embodiment, the method comprises forming a first layer of epitaxial silicon above a surface of a semiconducting substrate, forming a second layer of epitaxial silicon above the first layer of epitaxial silicon, forming a third layer of epitaxial silicon above the second layer of epitaxial silicon, forming a trench isolation region that extends through at least the third layer of epitaxial silicon and forming a portion of a semiconductor device above the third layer of epitaxial silicon within an area defined by the isolation region. In one illustrative embodiment, the device comprises a substrate, a first layer of epitaxial silicon formed above the substrate, a second layer of epitaxial silicon formed above the first layer of epitaxial silicon, a third layer of epitaxial silicon formed above the second layer of epitaxial silicon, a trench isolation region that extends through at least the third layer of epitaxial silicon, the trench isolation region defining an active area, and at least one component of a semiconductor device formed in or above the third layer of epitaxial silicon within the active area.